

Financial modeling and Valuation in Excel



PDF
Version

II. Excel's most useful functions

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If

IF

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Clipboard Font Alignment Number Styles

VLOOKUP X ✓ fx =IF(

1 If tests to see whether a certain condition is true or false...

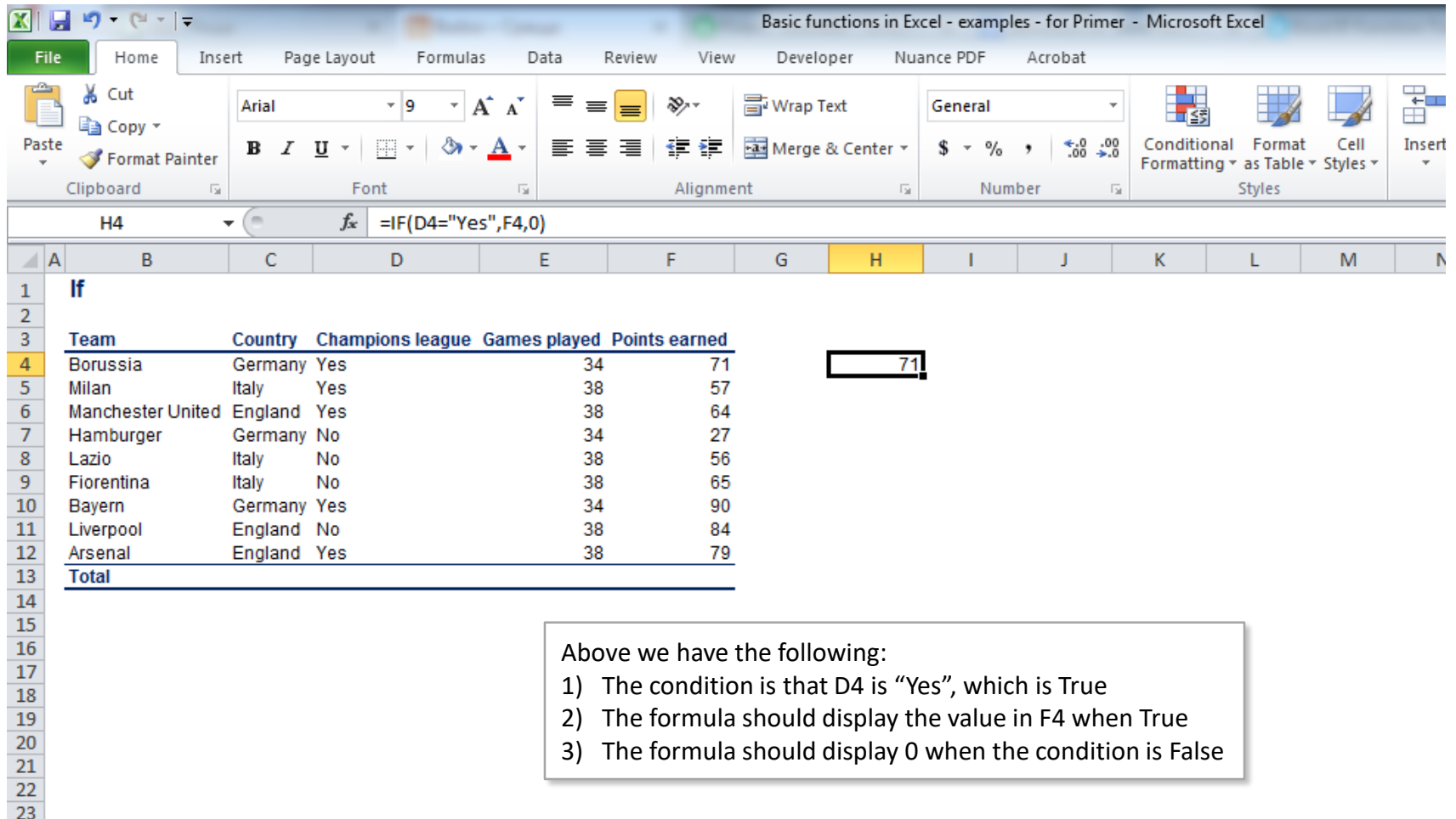
2 ...the Excel user selects as a second argument of the function the value to be displayed if the condition is TRUE

3 ...the Excel user selects as a third argument of the function the value to be displayed if the condition is FALSE

Team	Country	Champions league	Games played	Points earned
Borussia	Germany	Yes	34	71
Milan	Italy	Yes	38	57
Manchester United	England	Yes	38	64
Hamburger	Germany	No	34	27
Lazio	Italy	No	38	56
Fiorentina	Italy	No	38	65
Bayern	Germany	Yes	34	90
Liverpool	England	No	38	84
Arsenal	England	Yes	38	79
Total				

=IF(

IF



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Clipboard: Cut, Copy, Paste, Format Painter

Font: Arial, 9, Bold, Italic, Underline, Text Color, Background Color

Alignment: Wrap Text, Merge & Center

Number: General, \$, %, .00, .00

Conditional Formatting, Format as Table, Cell Styles, Insert

H4 fx =IF(D4="Yes",F4,0)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1														
2														
3		Team	Country	Champions league	Games played	Points earned								
4		Borussia	Germany	Yes	34	71		71						
5		Milan	Italy	Yes	38	57								
6		Manchester United	England	Yes	38	64								
7		Hamburger	Germany	No	34	27								
8		Lazio	Italy	No	38	56								
9		Fiorentina	Italy	No	38	65								
10		Bayern	Germany	Yes	34	90								
11		Liverpool	England	No	38	84								
12		Arsenal	England	Yes	38	79								
13		Total												
14														
15														
16														
17														
18														
19														
20														
21														
22														
23														

Above we have the following:

- 1) The condition is that D4 is "Yes", which is True
- 2) The formula should display the value in F4 when True
- 3) The formula should display 0 when the condition is False

IF

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H4 fx =IF(D4="Yes",F4,0)

Team	Country	Champions league	Games played	Points earned
Borussia	Germany	Yes	34	71
Milan	Italy	Yes	38	57
Manchester United	England	Yes	38	64
Hamburger	Germany	No	34	27
Lazio	Italy	No	38	56
Fiorentina	Italy	No	38	65
Bayern	Germany	Yes	34	90
Liverpool	England	No	38	84
Arsenal	England	Yes	38	79
Total				

Copying the function for the cells below, we obtain the value of points earned when a team played in the Champions League and 0 when it didn't play

Ready

SUM Functions: Sum, Sumif & Sumifs

The screenshot shows the Microsoft Excel interface with the following data in the worksheet:

Team	Country	Champions league	Games played	Points earned
Borussia	Germany	Yes	34	71
Milan	Italy	Yes	38	57
Manchester United	England	Yes	38	64
Hamburger	Germany	No	34	27
Lazio	Italy	No	38	56
Fiorentina	Italy	No	38	65
Bayern	Germany	Yes	34	90
Liverpool	England	No	38	84
Arsenal	England	Yes	38	79
Total			330	

The formula bar shows the formula `=SUM(E4:E12)` being entered into cell E13. The status bar at the bottom indicates the active cell is E13 and the formula is `=SUM(E4:E12)`.

Sum adds all the numbers in a given range of cells

SUMIF

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Clipboard Font Alignment Number Styles Cells Editing

VLOOKUP X ✓ ✖ =SUMIF(C4:C12,C18,E4:E12)

SUMIF(range, criteria, [sum_range])

Team	Country	Champions league	Games played	Points earned
Borussia	Germany	Yes	34	71
Milan	Italy	Yes	38	57
Manchester United	England	Yes	38	64
Hamburger	Germany	No	34	27
Lazio	Italy	No	38	56
Florentina	Italy	No	38	65
Bayern	Germany	Yes	34	90
Liverpool	England	No	38	84
Arsenal	England	Yes	38	79
Total			330	593

1 2 3

Sumif

1 "Range" contains the cells that will be evaluated

2 "Criteria" is the condition to be satisfied by the cells in the range

3 "Sum range" is the range with sells to be summed, when the condition is satisfied

Italy 2,C18:E4:E12

Index -> If Sum Sumif Sumifs Count Countif Countifs Vlookup Hlookup Index Match Index&Mat

100%

SUMIF

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E18 =SUMIF(C4:C12,C18,E4:E12)

Team	Country	Champions league	Games played	Points earned
Borussia	Germany	Yes	34	71
Milan	Italy	Yes	38	57
Manchester United	England	Yes	38	64
Hamburger	Germany	No	34	27
Lazio	Italy	No	38	56
Florentina	Italy	No	38	65
Bayern	Germany	Yes	34	90
Liverpool	England	No	38	84
Arsenal	England	Yes	38	79
Total			330	593

Italy 114

In the function to the left we have the following:
1) The first argument is the range C4:C12 – countries of origin

The second argument is C18 – Italy. It is the criterion that will be applied to the range. The function will sum the cells in the Sum range (3rd argument) only when it finds "Italy"

The sum range is from E4 to E12. The Sumif function sums the number of games played only for teams from Italy

SUMIFS

The screenshot shows an Excel spreadsheet titled "Sumifs". The main data table has columns: Team, Country, Champions league, Games played, and Points earned. The data rows are numbered 4 through 13. A formula bar at the top shows the formula: `=SUMIFS(F4:F12,C4:C12,C16,D4:D12,D16)`. The formula arguments are highlighted with colored boxes and numbered 1 through 5:

- 1**: F4:F12 (Points earned range)
- 2**: C4:C12 (Country range)
- 3**: C16 (Criteria 1: England)
- 4**: D4:D12 (Games played range)
- 5**: D16 (Criteria 2: Yes)

Below the main table, there are two separate ranges representing the criteria:

Criteria Range 1	Criteria Range 2
C16: England	D16: Yes

To the right of the spreadsheet, five numbered callouts explain each argument of the SUMIFS function:

- The first argument is the "Sum range". These are the cells to be summed if the conditions are satisfied.
- "Criteria range 1" contains the first range with cells that will be evaluated.
- "Criteria 1" is the condition to be satisfied by the cells in "Criteria range 1".
- "Criteria range 2" contains the second range with cells that will be evaluated.
- "Criteria 2" is the condition to be satisfied by the cells in "Criteria range 2".

SUMIFS

In the function to the left we have the following:

- 1) The first argument is the sum range F4:F12 – points earned
- The second argument is “Criteria range 1” C4:C12 – Countries of origin
- The third argument is C16 – “Italy”. It is the criterion that will be applied to the first range
- The fourth argument is “Criteria range 2” D4:D12 – Champions league participation
- The fifth argument is D16 – “Yes”. It is the criterion that will be applied to the second range

Team	Country	Champions league	Games played	Points earned
Borussia	Germany	Yes	34	71
Milan	Italy	Yes	38	57
Manchester United	England	Yes	38	64
Hamburger	Germany	No	34	27
Lazio	Italy	No	38	56
Florentina	Italy	No	38	65
Bayern	Germany	Yes	34	90
Liverpool	England	No	38	84
Arsenal	England	Yes	38	79
Total			330	593

Criteria Range 1	Criteria Range 2	Sum
England	Yes	143

COUNT Functions: Count, Counta, Countif, Countifs

COUNT

The screenshot shows the Microsoft Excel interface with the following details:

- Formula Bar:** Displays the formula `=COUNT(E4:E12)`.
- Worksheet:** Contains a table with the following data:

Team	Country	Champions league	Games played	Points earned
Borussia	Germany	Yes	34	71
Milan	Italy	Yes	38	57
Manchester United	England	Yes	38	64
Hamburger	Germany	No	34	27
Lazio	Italy	No	38	56
Fiorentina	Italy	No	38	65
Bayern	Germany	Yes	34	90
Liverpool	England	No	38	84
Arsenal	England	Yes	38	79
- Cell E14:** Contains the formula `COUNT(E4:E12)`, which is highlighted with a blue border.
- Annotations:** Two text boxes explain the function:
 - "COUNT counts the number of cells in a range that contain numbers"
 - "The function has only 1 argument – the range of cells to be counted"

COUNTA

The screenshot shows a Microsoft Excel window titled "Basic functions in Excel - examples - for Primer - Microsoft Excel". The ribbon is set to "Formulas". The active cell is B14, containing the formula `=COUNTA(B4:B12)`. The worksheet displays a table of football teams with columns: Team, Country, Champions league, Games played, and Points earned. The table data is as follows:

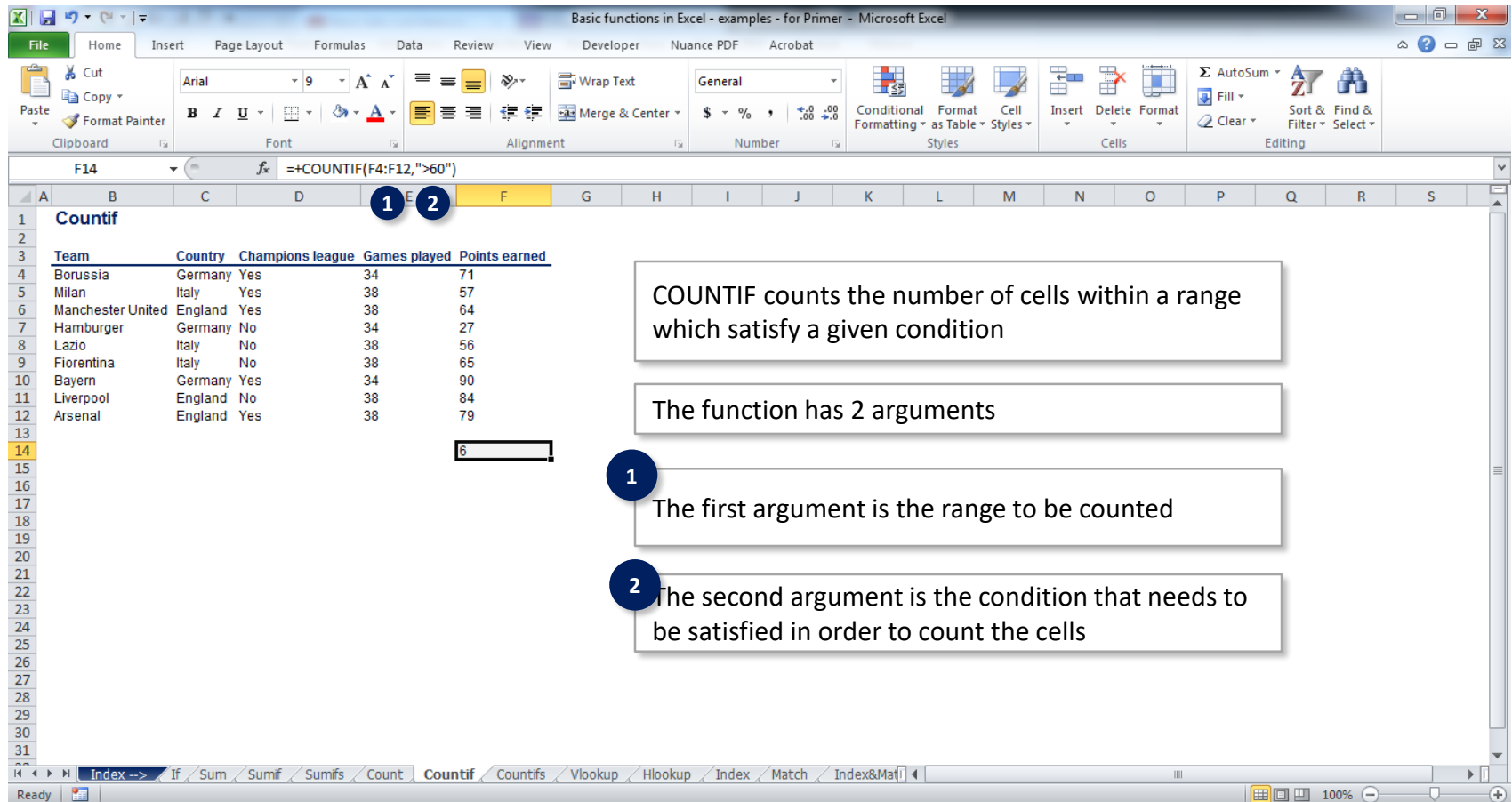
Team	Country	Champions league	Games played	Points earned
Borussia	Germany	Yes	34	71
Milan	Italy	Yes	38	57
Manchester United	England	Yes	38	64
Hamburger	Germany	No	34	27
Lazio	Italy	No	38	56
Fiorentina	Italy	No	38	65
Bayern	Germany	Yes	34	90
Liverpool	England	No	38	84
Arsenal	England	Yes	38	79

Below the table, cell B14 displays the result of the COUNTA function, which is 9. This indicates that there are 9 cells containing text in the range B4:B12.

COUNTA counts the number of cells in a range that contain text

The function has only 1 argument – the range of cells to be counted

COUNTIF



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F14 =+COUNTIF(F4:F12,">60")

Team	Country	Champions league	Games played	Points earned
Borussia	Germany	Yes	34	71
Milan	Italy	Yes	38	57
Manchester United	England	Yes	38	64
Hamburger	Germany	No	34	27
Lazio	Italy	No	38	56
Fiorentina	Italy	No	38	65
Bayern	Germany	Yes	34	90
Liverpool	England	No	38	84
Arsenal	England	Yes	38	79

Countif

1 The first argument is the range to be counted

2 The second argument is the condition that needs to be satisfied in order to count the cells

6

Ready

COUNTIF

The screenshot shows the Microsoft Excel interface with the following details:

- Formula Bar:** Displays the formula `=COUNTIF(F4:F12,">60")`.
- Worksheet:** Contains a table with the following data:

Team	Country	Champions league	Games played	Points earned
Borussia	Germany	Yes	34	71
Milan	Italy	Yes	38	57
Manchester United	England	Yes	38	64
Hamburger	Germany	No	34	27
Lazio	Italy	No	38	56
Fiorentina	Italy	No	38	65
Bayern	Germany	Yes	34	90
Liverpool	England	No	38	84
Arsenal	England	Yes	38	79
- Annotations:**
 - 1:** Points to the range F4:F12 in the formula bar.
 - 2:** Points to the condition `">60"` in the formula bar.
- Result:** Cell F14 displays the result `6`, which is circled in blue.
- Text Boxes:**
 - Box 1: "We would like to count how many teams earned more than 60 points. Therefore we select the range containing the number of points earned F4:F12"
 - Box 2: "The condition that needs to be satisfied is that a team earned more than 60 points"
- Summary:** A text box states: "Six teams earned more than 60 points".

COUNTIFS

COUNTIFS counts the number of cells within multiple ranges, which satisfy multiple conditions

The function has *n* arguments

1 The first argument is the “Criteria range 1”. The first range of cells that we would like to be evaluated

2 “Criteria 1” is the condition to be satisfied by the cells in “Criteria range 1”

3 “Criteria range 2” contains the second range with cells that will be evaluated

4 “Criteria 2” is the condition to be satisfied by the cells in “Criteria range 2”

The screenshot shows the Microsoft Excel interface with the following data table:

Team	Country	Champions league	Games played	Points earned
Borussia	Germany	Yes	34	71
Milan	Italy	Yes	38	57
Manchester United	England	Yes	38	64
Hamburger	Germany	No	34	27
Lazio	Italy	No	38	56
Fiorentina	Italy	No	38	65
Bayern	Germany	Yes	34	90
Liverpool	England	No	38	84
Arsenal	England	Yes	38	79

The formula bar shows: `=COUNTIFS(D4:D12,"Yes",F4:F12,">60")`

The formula is being entered in cell E14, and the range F4:F12 is highlighted.

COUNTIFS

In the example on this page we have the following:

We would like to count the teams that satisfy two conditions:

- 1) Participated in the Champions league ("Yes")
- 2) Earned more than 60 Points

1 The first argument is the range indicating whether a team played in the Champions league ("Yes" or "No")

2 Then we have the condition that needs to be satisfied: "Yes" as we want to count only the teams which participated in the Champions league

3 The third argument is the range which contains the number of points earned by each team

4 We want to count only teams that earned more than 60 points

The screenshot shows an Excel spreadsheet with a table of football teams and a formula bar. The formula bar displays the formula: `=COUNTIFS(D4:D12,"Yes",F4:F12,">60")`. The formula is highlighted with four numbered circles: 1 points to the range `D4:D12`, 2 points to the criteria `"Yes"`, 3 points to the range `F4:F12`, and 4 points to the criteria `">60"`. The table below the formula bar lists the following data:

Team	Country	Champions league	Games played	Points earned
Borussia	Germany	Yes	34	71
Milan	Italy	Yes	38	57
Manchester United	England	Yes	38	64
Hamburger	Germany	No	34	27
Lazio	Italy	No	38	56
Florentina	Italy	No	38	65
Bayern	Germany	Yes	34	90
Liverpool	England	No	38	84
Arsenal	England	Yes	38	79

The formula bar also shows the active cell address `F14` and the formula `=COUNTIFS(D4:D12,"Yes",F4:F12,">60")`. The spreadsheet title is "Basic functions in Excel - examples - for Primer - Microsoft Excel".

Lookup Functions: Vlookup & Hlookup

VLOOKUP

Vlookup

Team	Country	Champions league	Games played	Points earned
Borussia	Germany	Yes	34	71
Milan	Italy	Yes	38	57
Manchester United	England	Yes	38	64
Hamburger	Germany	No	34	27
Lazio	Italy	No	38	56
Fiorentina	Italy	No	38	65
Bayern	Germany	Yes	34	90
Liverpool	England	No	38	84
Arsenal	England	Yes	38	79

Team Country league Games played Points earned

Lazio				
Borussia				

Use Vlookup in order to fill the table to the right with data from the table to the left

VLOOKUP

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VLOOKUP

`=VLOOKUP(lookup_value, table_array, col_index_num, [range_lookup])`

Vlookup

Team	Country	Champions league	Games played	Points earned
Borussia	Germany	Yes	34	71
Milan	Italy	Yes	38	57
Manchester United	England	Yes	38	64
Hamburger	Germany	No	34	27
Lazio	Italy	No	38	56
Fiorentina	Italy	No	38	65
Bayern	Germany	Yes	34	90
Liverpool	England	No	38	84
Arsenal	England	Yes	38	79

Champions league

Team	Country	league	Games played	Points earned
Lazio		VLOOKUP!		
Borussia				

VLOOKUP looks for a value in the leftmost column of a table, and then returns a value in the same row from a column that you specify

Index -> If Sum Sumif Sumifs Count Countif Countifs Vlookup Hlookup Index Match Index&Match

Edit 100%

VLOOKUP

The screenshot shows the Microsoft Excel interface with the formula bar displaying `=VLOOKUP(`. The formula bar has four numbered callouts: 1 points to `lookup_value`, 2 points to `table_array`, 3 points to `col_index_num`, and 4 points to `[range_lookup]`. Below the formula bar, a table of football teams and their statistics is shown. The table has columns: Team, Country, Champions league, Games played, and Points earned. The first column (Team) is highlighted with a yellow background. The second column (Country) is highlighted with a yellow background. The third column (Champions league) is highlighted with a yellow background. The fourth column (Games played) is highlighted with a yellow background. The fifth column (Points earned) is highlighted with a yellow background. The table data is as follows:

Team	Country	Champions league	Games played	Points earned
Borussia	Germany	Yes	34	71
Milan	Italy	Yes	38	57
Manchester United	England	Yes	38	64
Hamburger	Germany	No	34	27
Lazio	Italy	No	38	56
Fiorentina	Italy	No	38	65
Bayern	Germany	Yes	34	90
Liverpool	England	No	38	84
Arsenal	England	Yes	38	79

Below the table, there are four numbered callouts explaining the arguments of the VLOOKUP function:

- 1 The first argument is the value that we need to find in the leftmost column of the table
- 2 The second argument is the table where we will be looking at
- 3 The third argument is the column from which we would like to make an extraction
- 4 Fourth argument is a logical value; we indicate whether we want the closest match ("TRUE") or an exact match ("FALSE")

VLOOKUP

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VLOOKUP X f_x `=VLOOKUP(H4,$B$4:$F$12,2,FALSE)`

Vlookup

Team	Country	Champions league	Games played	Points earned
Borussia	Germany	Yes	34	71
Milan	Italy	Yes	38	57
Manchester United	England	Yes	38	64
Hamburger	Germany	No	34	27
Lazio	Italy	No	38	56
Fiorentina	Italy	No	38	65
Bayern	Germany	Yes	34	90
Liverpool	England	No	38	84
Arsenal	England	Yes	38	79

Team Country Champions league Games played Points earned

1 Lazio 2 FALSE

2

1

2

3

4

Index -> If Sum Sumif Sumifs Count Countif Countifs Vlookup Hlookup Index Match

Edit

An example makes things much easier:

1 Our lookup value is Lazio – H4. We would like to find this value in the leftmost column of the table to the left

2 The second argument is the table with data : B4:F12. The function will look for Lazio in the leftmost column of the table - B4:B12

3 We select 2 as a column number, as we would like to obtain a value from the second column of the table when it finds a match for Lazio

4 The fourth argument is "FALSE" because we need an exact match

VLOOKUP

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Formula bar: I4 =VLOOKUP(H4,\$B\$4:\$F\$12,2,FALSE)

Vlookup

Team	Country	Champions league	Games played	Points earned
Borussia	Germany	Yes	34	71
Milan	Italy	Yes	38	67
Manchester United	England	Yes	38	64
Hamburger	Germany	No	34	27
Lazio	Italy	No	38	56
Florentina	Italy	No	38	65
Bayern	Germany	Yes	34	90
Liverpool	England	No	38	84
Arsenal	England	Yes	38	79

Lookup value

Team	Country	Champions league	Games played	Points earned
Lazio	Italy			
Borussia				

The Lookup Value needs to be found within the leftmost column of the table

Ready | Index | If | Sum | Sumif | Sumifs | Count | Countif | Countifs | Vlookup | Hlookup | Index | Match | Index&Match | 100%

VLOOKUP

Basic functions in Excel - examples - for Primer - Microsoft Excel

Formula bar: `=VLOOKUP(H4,$B$4:$F$12,2, FALSE)`

Vlookup

1. Team
2. Country
3. Champions league
4. Games played
5. Points earned

Team	Country	Champions league	Games played	Points earned
Borussia	Germany	Yes	34	71
Milan	Italy	Yes	38	57
Manchester United	England	Yes	38	64
Hamburger	Germany	No	34	27
Lazio	Italy	No	38	56
Florentina	Italy	No	38	65
Bayern	Germany	Yes	34	90
Liverpool	England	No	38	84
Arsenal	England	Yes	38	79

Once the lookup value has been found, we indicate which column we would like to obtain as a result. In this case we have indicated the second column "Country"

Ready

HLOOKUP

The screenshot shows an Excel spreadsheet with two tables. The first table (left) has 5 columns: Team, Country, Champions league, Games played, and Points earned. The second table (right) has 5 columns: Team, Country, Champions league, Games played, and Points earned. The formula bar shows the HLOOKUP function: `=HLOOKUP(M5,I4:J7,2,0)`. A callout box points to the formula bar with the text: "Use Hlookup in order to fill the table to the right with data from the table to the left".

Team	Country	Champions league	Games played	Points earned
Milan	Germany	Yes	34	71
Hamburger	Italy	Yes	38	57
	England	Yes	38	64
	Germany	No	34	27

HLOOKUP

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Clipboard Font Alignment Number Styles Cells Editing

VLOOKUP **Hlookup**

Hlookup

Team	Borussia	Milan	Manchester United	Hamburger
Country	Germany	Italy	England	Germany
Champions league	Yes	Yes	Yes	No
Games played	34	38	38	34
Points earned	71	57	64	27

Team	Country	Champions league	Games played	Points earned
Milan	HLOOKUP!			
Hamburger				

HLOOKUP looks for a value in the top row of a table, and then returns a value in the same column from a row that you specify

Index -> If Sum Sumif Sumifs Count Countif Countifs Vlookup **Hlookup** Index Match Index&Ma

Enter 100%

HLOOKUP

Hlookup

1 2 3 4

Team Borussia Milan Manchester United Hamburger
Country Germany Italy England Germany
Champions league Yes Yes Yes No
Games played 34 38 38 34
Points earned 71 57 64 27

Team Country league Games played Points earned
Milan
Hamburger

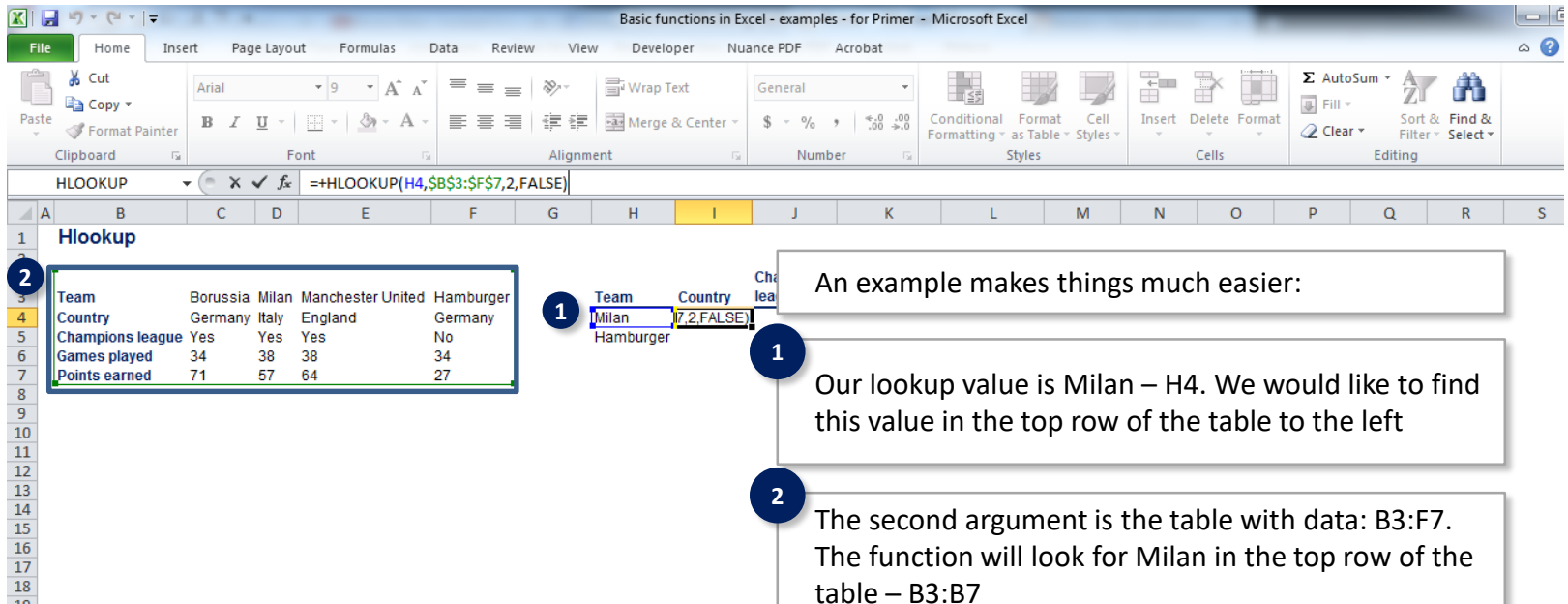
1 The first argument is the value that we need to find in the top row of the table

2 The second argument is the table where we will be looking at

3 The third argument is the row from which we would like to make an extraction

4 Fourth argument is a logical value; we indicate whether we want the closest match ("TRUE") or an exact match ("FALSE")

HLOOKUP



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Clipboard Font Alignment Number Styles Cells Editing

HLOOKUP $\text{=HLOOKUP(H4,\$B\$3:\$F\$7,2,FALSE)}$

Team	Borussia	Milan	Manchester United	Hamburger
Country	Germany	Italy	England	Germany
Champions league	Yes	Yes	Yes	No
Games played	34	38	38	34
Points earned	71	57	64	27

1 Team Country
Milan 72 FALSE
Hamburger

2

3

4

An example makes things much easier:

1 Our lookup value is Milan – H4. We would like to find this value in the top row of the table to the left

2 The second argument is the table with data: B3:F7. The function will look for Milan in the top row of the table – B3:B7

3 We select 2 as a row number as we would like to obtain a value from the second row of the table when it finds a match for Milan

4 The fourth argument is “FALSE” because we need an exact match

HLOOKUP

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Clipboard Font Alignment Number Styles Cells Editing

Formula bar: `=HLOOKUP(H4,$B$3:$F$7,2,FALSE)`

Hlookup

Team	Borussia	Milan	Manchester United	Hamburger
Country	Germany	Italy	England	Germany
Champions league	Yes	Yes	Yes	No
Games played	34	38	38	34
Points earned	71	57	64	27

The Lookup Value needs to be found within the top row of the table

Team Country Champions league Games played Points earned
Milan Italy
Hamburger

Index -> If Sum Sumif Sumifs Count Countif Countifs Vlookup Hlookup Index Match Index&Mat

HLOOKUP

Basic functions in Excel - examples - for Primer - Microsoft Excel

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Clipboard Font Alignment Number Styles Cells Editing

HLOOKUP X $\checkmark$ f_x `=HLOOKUP(H4,$B$3:$F$5,2,TRUE)`

Team	Borussia	Milan	Manchester United	Hamburger
Country	Germany	Italy	England	Germany
Champions league	Yes	Yes	Yes	No
Games played	34	38	38	34
Points earned	71	57	64	27

1
2
3
4
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14
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25
26
27
28
29
30

Team Country Champions league Games played Points earned
Milan 72, FALSE
Hamburger

Once the lookup value has been found, we indicate which row we would like to obtain as a result. In this case we have indicated the second row "Country"

Index -> If Sum Sumif Sumifs Count Countif Countifs Vlookup Hlookup Index Match Index&Match

Edit 100%

Index & Match

INDEX

Index is a function which returns a value from the intersection of a row and column

The function has **3** arguments

1

The first argument is the array in which we would like to make an extraction

2

The second argument is the row number within the array

3

The third argument is the column number within the array

The screenshot shows the Microsoft Excel interface with the following data in the worksheet:

Team	Country	Champions league	Games played	Points earned
Borussia	Germany	Yes	34	71
Milan	Italy	Yes	38	57
Manchester United	England	Yes	38	64
Hamburger	Germany	No	34	27
Lazio	Italy	No	38	56
Fiorentina	Italy	No	38	65
Bayern	Germany	Yes	34	90
Liverpool	England	No	38	84
Arsenal	England	Yes	38	79

The formula bar shows the formula: `=INDEX(B4:C12,5,2)`. The cell F17 contains the result of the formula, which is 56. The status bar at the bottom shows the formula bar content: `EX(B4:C12,5,2)`.

INDEX

Basic functions in Excel - examples - for Primer - Microsoft Excel

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F17 fx =INDEX(B4:C12,5,2)

Team	Country	Champions league	Games played	Points earned
Borussia	Germany	Yes	34	71
Milan	Italy	Yes	38	57
Manchester United	England	Yes	38	64
Hamburger	Germany	No	34	27
Lazio	Italy	No	38	56
Fiorentina	Italy	No	38	65
Bayern	Germany	Yes	34	90
Liverpool	England	No	38	84
Arsenal	England	Yes	38	79

Index finds the intersection between the 5th row and the 2nd column within the array B4:C12 and delivers its result

Italy

MATCH

Basic functions in Excel - examples - for Primer - Microsoft Excel

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HLOOKUP X ✓ fx =MATCH(H4,B4:B12,0)

Match

Team	Country	Champions league	Games played	Points earned
Borussia	Germany	Yes	34	71
Milan	Italy	Yes	38	57
Manchester United	England	Yes	38	64
Hamburger	Germany	No	34	27
Lazio	Italy	No	38	56
Fiorentina	Italy	No	38	65
Bayern	Germany	Yes	34	90
Liverpool	England	No	38	84
Arsenal	England	Yes	38	79

Milan B4:B12,0

Match returns the relative position of an item within an array

Match has 3 arguments

- 1 "Look up value" is the value that you want to find in order to obtain the number that you are looking for
- 2 "Look up array" is the array in which we will look for the "look up value"
- 3 The third argument is a logical value: "0" for an exact match and "1" for closest match

Match Index&Match Iferror Choose Average&Averageif Max,min Goal seek Data tables Left, right, mid

MATCH

Basic functions in Excel - examples - for Primer - Microsoft Excel

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Formula bar: I4 =MATCH(H4,B4:B12,0)

Team	Country	Champions league	Games played	Points earned
Borussia	Germany	Yes	34	71
Milan	Italy	Yes	38	57
Manchester United	England	Yes	38	64
Hamburger	Germany	No	34	27
Lazio	Italy	No	38	56
Fiorentina	Italy	No	38	65
Bayern	Germany	Yes	34	90
Liverpool	England	No	38	84
Arsenal	England	Yes	38	79

Lookup value: Milan

Array: 2

The output of the function is 2 because Milan is the 2nd value within the array

Ready

INDEX & MATCH

The screenshot shows a Microsoft Excel window titled "Basic functions in Excel - examples - for Primer - Microsoft Excel". The ribbon includes File, Home, Insert, Page Layout, Formulas, Data, Review, View, Developer, Nuance PDF, and Acrobat. The Formulas ribbon is active, showing the INDEX and MATCH functions in the Formula Library. The worksheet contains two tables. The first table, titled "Index & Match", is located in the range A4:E12. The second table, which is partially filled, is located in the range J4:M5. A text box with a blue arrow pointing to the second table explains the use of INDEX & MATCH. Another text box below it states that INDEX & MATCH is an effective substitute for VLOOKUP.

Team	Country	Champions league	Games played	Points earned
Borussia	Germany	Yes	34	71
Milan	Italy	Yes	38	57
Manchester United	England	Yes	38	64
Hamburger	Germany	No	34	27
Lazio	Italy	No	38	56
Fiorentina	Italy	No	38	65
Bayern	Germany	Yes	34	90
Liverpool	England	No	38	84
Arsenal	England	Yes	38	79

Team	Country	Champions league	Games played	Points earned
Milan				
Hamburger				

Use Index & Match in order to fill the table to the right with data from the table to the left

Index & Match is an **effective substitute of Vlookup**

INDEX & MATCH

Basic functions in Excel - examples - for Primer - Microsoft Excel

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Clipboard Font Alignment Number Styles Cells Editing

Formula Bar: `=INDEX(C4:C12,MATCH($I4,$B$4:$B$12,0))`

Team	Country	Champions league	Games played	Points earned
Borussia	Germany	Yes	34	71
Milan	Italy	Yes	38	57
Manchester United	England	Yes	38	64
Hamburger	Germany	No	34	27
Lazio	Italy	No	38	56
Fiorentina	Italy	No	38	65
Bayern	Germany	Yes	34	90
Liverpool	England	No	38	84
Arsenal	England	Yes	38	79

Team Country Champions league Games played Points earned

Milan Italy

Hamburger

Index & Match

Match will deliver as an output the position of the lookup value Milan in the array B4:12. In this example it is 2. Then Index will supply the 2nd value within the range C4:C12 - Italy

Index needs a row number (column number is optional)

Match is nested in the Index function in order to provide the row number

Index Match Index&Match Iferror Choose Average&Averageif Max,min Goal seek Data tables Left, right

Average & Averageif

Basic functions in Excel - examples - for Primer - Microsoft Excel

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E15 f_x `=AVERAGE(E4:E12)`

Average and Averageif

Team	Country	Champions league	Games played	Points earned
Borussia	Germany	Yes	34	71
Milan	Italy	Yes	38	57
Manchester United	England	Yes	38	64
Hamburger	Germany	No	34	n.a.
Lazio	Italy	No	38	56
Fiorentina	Italy	No	38	65
Bayern	Germany	Yes	34	90
Liverpool	England	No	38	84
Arsenal	England	Yes	38	79

15 36.67

"Average" returns the arithmetic mean (the average) of a range of numbers

Ready Index Match Index&Match Iferror Choose Average&Averageif Max,min Goal seek Data tables Left, right 100%

AVERAGEIF

The screenshot shows the Microsoft Excel interface with the following data table:

Team	Country	Champions league	Games played	Points earned
Borussia	Germany	Yes	34	71
Milan	Italy	Yes	38	57
Manchester United	England	Yes	38	64
Hamburger	Germany	No	34	n.a.
Lazio	Italy	No	38	56
Fiorentina	Italy	No	38	65
Bayern	Germany	Yes	34	90
Liverpool	England	No	38	84
Arsenal	England	Yes	38	79

The formula bar shows the formula: `=AVERAGEIF(D4:D12,"Yes",F4:F12)`. The formula is entered in cell F15.

Three numbered callouts explain the components of the AVERAGEIF function:

- 1 "Range" contains the cells that will be evaluated
- 2 "Criteria" is the condition to be satisfied by the cells in the range
- 3 "Average range" is the range with sells to be averaged when the condition is satisfied

AVERAGEIF

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Clipboard Font Alignment Number Styles Cells Editing

F15 $\text{=AVERAGEIF(D4:D12,"Yes",F4:F12)}$

Team	Country	Champions league	Games played	Points earned
Borussia	Germany	Yes	34	71
Milan	Italy	Yes	38	57
Manchester United	England	Yes	38	64
Hamburger	Germany	No	34	n.a.
Lazio	Italy	No	38	56
Florentina	Italy	No	38	65
Bayern	Germany	Yes	34	90
Liverpool	England	No	38	84
Arsenal	England	Yes	38	79

72.2

In the function to the left we have the following:
1) The first argument is the range D4:D12 – participation in Champions league (“Yes” or “No”)

The second argument is “Yes”. It is the criterion that will be applied to the range. The function will provide the average of the cells which satisfy the “Yes” condition

The “average range” is from F4 to F12. The Averageif function averages the number of points earned only for teams participating in the Champions league

lerror

IFERROR

The screenshot shows the Microsoft Excel interface with the following data table:

Team	Country	Champions league	Games played	Points earned	% of points earned
Borussia	Germany	Yes	34	71	=IFERROR(F4/\$F\$13,"n.a.")
Milan	Italy	Yes	38	57	
Manchester United	England	Yes	38	64	
Hamburger	Germany	No	34	n.a.	
Lazio	Italy	No	38	56	
Fiorentina	Italy	No	38	65	
Bayern	Germany	Yes	34	90	
Liverpool	England	No	38	84	
Arsenal	England	Yes	38	79	
Total			330	566	

The formula bar shows: `=IFERROR(F4/$F$13,"n.a.")`

Callout 1: The first argument of the function is an expression or formula that needs to be tested for an error

Callout 2: The second argument is the value to be displayed when there is an error in the first argument

IFERROR

Basic functions in Excel - examples - for Primer - Microsoft Excel

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Clipboard Font Alignment Number Styles Cells Editing

H4 fx $\text{=IFERROR}(F4/\$F\$13,"n.a.")$

Team	Country	Champions league	Games played	Points earned	% of points earned
Borussia	Germany	Yes	34	71	13%
Milan	Italy	Yes	38	57	
Manchester United	England	Yes	38	64	
Hamburger	Germany	No	34	n.a.	
Lazio	Italy	No	38	56	
Florentina	Italy	No	38	65	
Bayern	Germany	Yes	34	90	
Liverpool	England	No	38	84	
Arsenal	England	Yes	38	79	
Total			330	566	

Iferror tests whether there is an error in the expression that we have as a first argument (F4 divided by F13). There isn't an error, therefore it delivers the expression's result

Ready | Iferror | Choose | Average&Averageif | Max,min | Goal seek | Data tables | Left, right, mid | Upper,Lower & Proper | 100%

IFERROR

Basic functions in Excel - examples - for Primer - Microsoft Excel

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Clipboard Font Alignment Number Styles Cells Editing

H7 $\text{=IFERROR}(F7/\$F\$13,"n.a.")$

	Team	Country	Champions league	Games played	Points earned	% of points earned
4	Borussia	Germany	Yes	34	71	13%
5	Milan	Italy	Yes	38	57	10%
6	Manchester United	England	Yes	38	64	11%
7	Hamburger	Germany	No	34	error	n.a.
8	Lazio	Italy	No	38	56	10%
9	Fiorentina	Italy	No	38	65	11%
10	Bayern	Germany	Yes	34	90	16%
11	Liverpool	England	No	38	84	15%
12	Arsenal	England	Yes	38	79	14%
13	Total			330	566	

Copying the function downwards we can see that when it finds an error it displays "n.a", as we wanted it to

Iferror Choose Average&Averageif Max,min Goal seek Data tables Left, right, mid Upper,Lower & Proper

Text functions

LEFT

The screenshot shows the Microsoft Excel interface. The title bar reads "Basic functions in Excel - examples - for Primer - Microsoft Excel". The ribbon is set to "Home". The formula bar shows the formula `=LEFT(B4,3)`. Cell E4 is selected and contains the text "Dop".

Left, right, mid

Doppelkupplungsgetriebe **Dop**

The function returns the first three characters from the beginning of the text

Left returns a given number of characters from the beginning of a text string

RIGHT

The screenshot shows the Microsoft Excel interface. The title bar reads "Basic functions in Excel - examples - for Primer - Microsoft Excel". The ribbon includes File, Home, Insert, Page Layout, Formulas, Data, Review, View, Developer, Nuance PDF, and Acrobat. The Home ribbon is active, showing options for Clipboard, Font, Alignment, Number, Styles, Cells, and Editing. The formula bar shows the formula `=RIGHT(B5,3)` in cell E5. The spreadsheet shows cell B5 containing the text "Doppelkupplungsgetriebbe". Cell E5 displays the result "bbe". A text box on the right states: "Right returns a given number of characters from the end of a text string".

Left, right, mid

The function returns the first three characters from the end of the text

Right returns a given number of characters from the end of a text string

MID

Left, right, mid

The function returns seven characters starting from the fourth character of the text

Mid returns a given number of characters from the middle of a text string

The function has 3 arguments: text, starting number and number of characters

UPPER

The screenshot displays the Microsoft Excel interface with the 'Home' tab selected. The formula bar shows the formula `=UPPER(B3)` in cell E3. The worksheet contains the following data:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	
1		Upper, Lower & Proper																		
2																				
3		doppelkupplungsgetriebe			DOPPELKUPPLUNGSGETRIEBE															
4																				
5																				
6																				
7																				
8																				
9																				
10																				
11																				
12																				
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25																				
26																				
27																				
28																				
29																				
30																				
31																				

A text box with the text "Upper converts a text to all uppercase letters" is positioned over the result in cell E3.

LOWER

The screenshot shows the Microsoft Excel interface with the following details:

- Title Bar:** Basic functions in Excel - examples - for Primer - Microsoft Excel
- Ribbon:** File, Home, Insert, Page Layout, Formulas, Data, Review, View, Developer, Nuance PDF, Acrobat.
- Formulas Bar:** E4, fx, =LOWER(B4)
- Worksheet:**
 - Row 1: Upper, Lower & Proper
 - Row 4: doppelkupplungsgetrieBE (in B4), doppelkupplungsgetriebe (in E4)
- Text Box:** Lower converts a text to all lowercase letters
- Status Bar:** Ready, Choose, Average&Averageif, Max,min, Goal seek, Data tables, Left, right, mid, Upper,Lower & Proper, &,Concl, 100%

PROPER

The screenshot shows the Microsoft Excel interface with the following details:

- Formula Bar:** Displays the formula `=PROPER(B5)`.
- Worksheet:** Cell B5 contains the text `doppelkupplungsgetriebE`. Cell E5 contains the result `Doppelkupplungsgetriebe`.
- Text Box:** A callout box states: "Proper converts a text to proper case. The first letter of each word is an uppercase letter and the rest of the letters are lowercase".
- Taskbar:** The active window is titled "Basic functions in Excel - examples - for Primer - Microsoft Excel". The status bar at the bottom shows "Ready" and "100%" zoom.

& and CONCATENATE

The screenshot displays the Microsoft Excel interface with the title bar "Basic functions in Excel - examples - for Primer - Microsoft Excel". The ribbon includes tabs for File, Home, Insert, Page Layout, Formulas, Data, Review, View, Developer, Nuance PDF, and Acrobat. The Home tab is active, showing groups for Clipboard, Font, Alignment, Number, Styles, Cells, and Editing. The formula bar shows the active cell C6 with the formula `=B4&C4&D4`. The worksheet grid shows columns A through U and rows 1 through 31. In row 4, cells B4, C4, and D4 contain the text "ABC", "123", and "CDE" respectively. In row 6, cell C6 contains the concatenated result "ABC123CDE". A text box with a black border and white background is overlaid on the right side of the grid, containing the text "& is able to join separate text strings in the same cell". The status bar at the bottom shows "Ready" and a list of functions: Max, min, Goal seek, Data tables, Left, right, mid, Upper, Lower & Proper, &, Concatenate, Pivot tables, and Pivot t.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1																					
2																					
3																					
4			ABC	123	CDE																
5																					
6			ABC123CDE																		
7																					
8																					
9																					
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29																					
30																					
31																					

& and CONCATENATE

The screenshot displays the Microsoft Excel interface with the title bar "Basic functions in Excel - examples - for Primer - Microsoft Excel". The ribbon includes tabs for File, Home, Insert, Page Layout, Formulas, Data, Review, View, Developer, Nuance PDF, and Acrobat. The Formulas tab is active, showing the formula bar with the formula `=CONCATENATE(B4,C4,D4)` and the formula cell C7. The worksheet grid shows columns A through U and rows 1 through 31. The title of the worksheet is "& and Concatenate". In row 4, cells B4, C4, and D4 contain the text "ABC", "123", and "CDE" respectively. In row 7, cell C7 contains the concatenated result "ABC123CDE". A text box on the right side of the worksheet states: "CONCATENATE is able to join separate text strings in the same cell". The status bar at the bottom shows "Ready" and a zoom level of 100%.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1																					
2																					
3																					
4			ABC	123	CDE																
5																					
6																					
7			ABC123CDE																		
8																					
9																					
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31																					

Choose

CHOOSE

Choose is a very useful function for financial modeling purposes. It allows users to build scenarios for a given model

Choose is composed of 3 or more arguments

1 An index number which determines the value that will be selected

2 Value 1 is the value which will be selected when the index number is set at 1

3 Value 2 is the value which will be selected when the index number is set at 2

...

n Value n is the value which will be selected when the index number is set at n

	FY11	FY12	FY13	FY14
Revenues	135	145	150	
Optimistic case	124	135	145	150
Base case	120	132	140	144
Worst case	111	109	104	98

CHOOSE

The screenshot shows an Excel spreadsheet with the following data:

		FY11	FY12	FY13	FY14
Revenues		120	132	140	144
Optimistic case		124	135	145	150
Base case		120	132	140	144
Worst case		111	109	104	98

The formula bar shows the formula: `=CHOOSE(2, Revenues)`. The cell I4 contains the value 2. A callout box explains: "When the index number is 2 the function picks the 2nd range of values".

Max & Min

Max

The screenshot shows the Microsoft Excel interface with the following details:

- Formula Bar:** Displays the formula `=MAX(F4:F12)` in cell F15.
- Worksheet:** Contains a table titled "Max & Min" with the following data:

Team	Country	Champion	Games played	Points earned
Borussia	Germany	Yes	34	71
Milan	Italy	Yes	38	57
Manchester United	England	Yes	38	64
Hamburger	Germany	No	34	27
Lazio	Italy	No	38	56
Fiorentina	Italy	No	38	65
Bayern	Germany	Yes	34	90
Liverpool	England	No	38	84
Arsenal	England	Yes	38	79
- Cell F15:** Contains the value 90, which is the result of the MAX function applied to the range F4:F12.
- Annotations:** Two text boxes with arrows pointing to the result in cell F15:
 - Top box: "Max finds the largest value in a set of values"
 - Bottom box: "By using Max we were able to find out that the highest number of points earned is 90"
- Task Pane:** Located at the bottom, it shows the "Max, min" option selected under the "Formulas" tab.

Min

The screenshot shows the Microsoft Excel interface with the following data in the worksheet:

Team	Country	Champion	Games played	Points earned
Borussia	Germany	Yes	34	71
Milan	Italy	Yes	38	57
Manchester United	England	Yes	38	64
Hamburger	Germany	No	34	27
Lazio	Italy	No	38	56
Florentina	Italy	No	38	65
Bayern	Germany	Yes	34	90
Liverpool	England	No	38	84
Arsenal	England	Yes	38	79

The formula bar shows the formula `=MIN(F4:F12)` in cell F16. A blue arrow points from the text box to the value 27 in cell F7, which is the minimum value in the range F4:F12.

Min finds the smallest value in a set of values

By using Min we were able to find out that the lowest number of points earned is 27

Goal seek

GOAL SEEK

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Cut Copy Paste Format Painter Clipboard

Arial 9 Bold Italic Underline Font Color

Alignment Wrap Text Merge & Center

General \$ % , .00

C6 fx =C4+C5

	A	B	C	D	E	F	G	H	I	J	K	L
1		Goal seek										
2												
3		<u>\$ in billion</u>	<u>FY11</u>									
4		Revenues	34									
5		Variable costs										
6		Gross Margin	34									
7												
8												
9												
10												
11												
12												
13												
14												
15												

Goal Seek allows you to obtain an input that would result into a given level of output

For example, we would like to find how much will be Variable costs in order to obtain a Gross Margin of 17

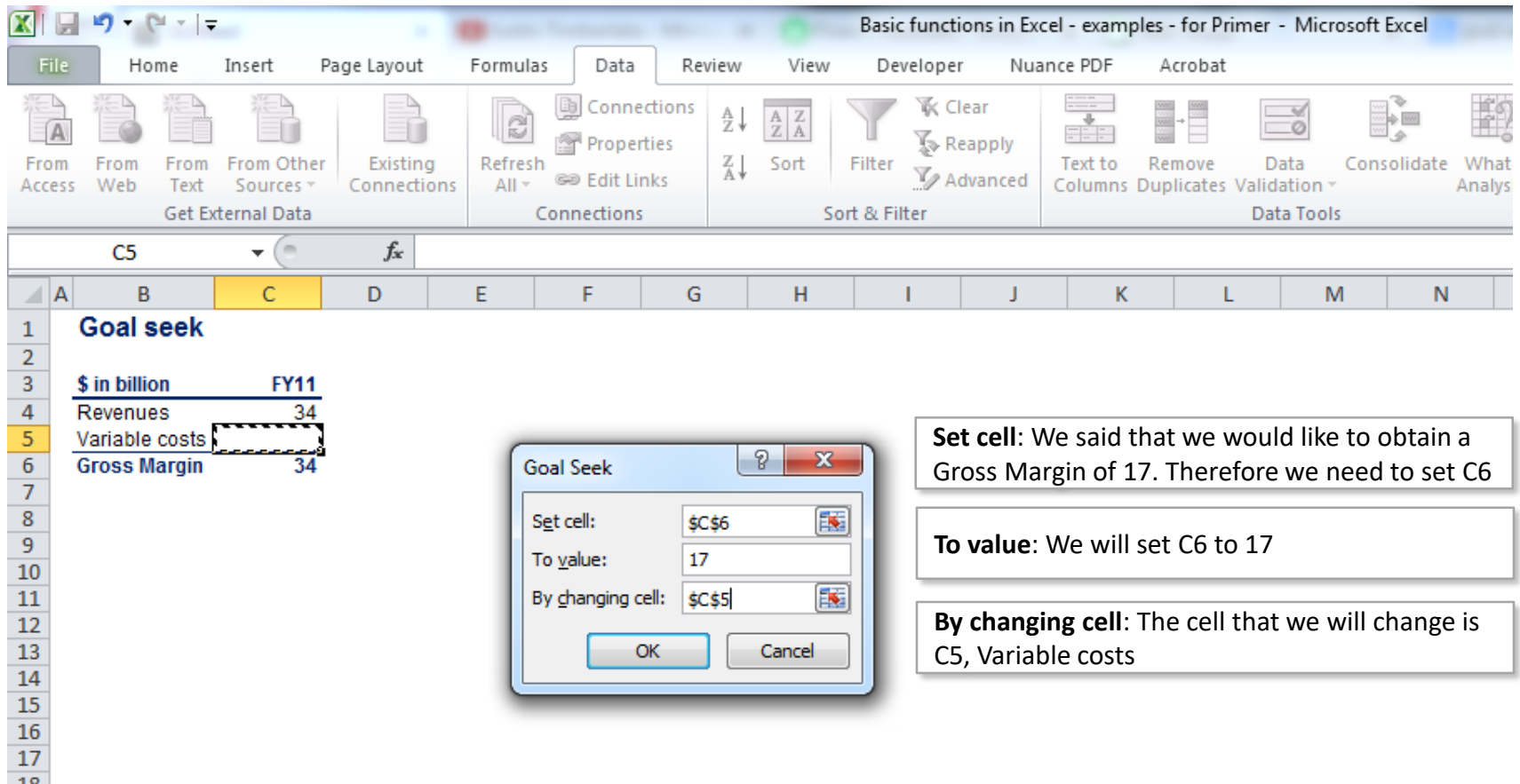
GOAL SEEK

The screenshot shows the Microsoft Excel interface with the 'Data' tab selected. The 'What-If Analysis' dropdown menu is open, and 'Goal Seek...' is highlighted. In the background, a worksheet titled 'Goal seek' is visible with the following data:

		FY11
\$ in billion		
Revenues		34
Variable costs		
Gross Margin		34

We can find the Goal Seek function in the “Data” tab and selecting “What if Analysis”

GOAL SEEK



The screenshot shows the Microsoft Excel interface with the 'Data' tab selected. The worksheet contains the following data:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1		Goal seek												
2														
3		\$ in billion	FY11											
4		Revenues	34											
5		Variable costs												
6		Gross Margin	34											

The Goal Seek dialog box is open, showing the following settings:

- Set cell:** \$C\$6
- To value:** 17
- By changing cell:** \$C\$5

Buttons: OK, Cancel

Set cell: We said that we would like to obtain a Gross Margin of 17. Therefore we need to set C6

To value: We will set C6 to 17

By changing cell: The cell that we will change is C5, Variable costs

GOAL SEEK

The screenshot shows the Microsoft Excel interface with the 'Data' tab selected. The spreadsheet contains the following data:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1																					
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					
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22																					
23																					
24																					
25																					
26																					
27																					
28																					
29																					
30																					
31																					

The 'Goal seek' dialog box is open, showing the following information:

- Goal Seeking with Cell C6 found a solution.
- Target value: 17
- Current value: 17
- Buttons: Step, Pause, OK, Cancel

Two text boxes on the right provide context:

Here is the solution which Goal Seek found: Variable costs need to be -17, in order to obtain a Gross Margin of 17

That was quite obvious, but imagine a financial model with many formulas interacting with each other. Goal Seek can be pretty useful in such situations

Data tables

DATA TABLES

Basic functions in Excel - examples - for Prime

File Home Insert Page Layout Formulas Data Review View Developer Nuance PDF Acrobat

Cut Copy Paste Format Painter Clipboard

Arial 9 A A B I U Font

Alignment Merge & Center Number

C8 $=C5*(1+C4)^C6$

Parameter	Value
i	10%
Financing	1000
t	5

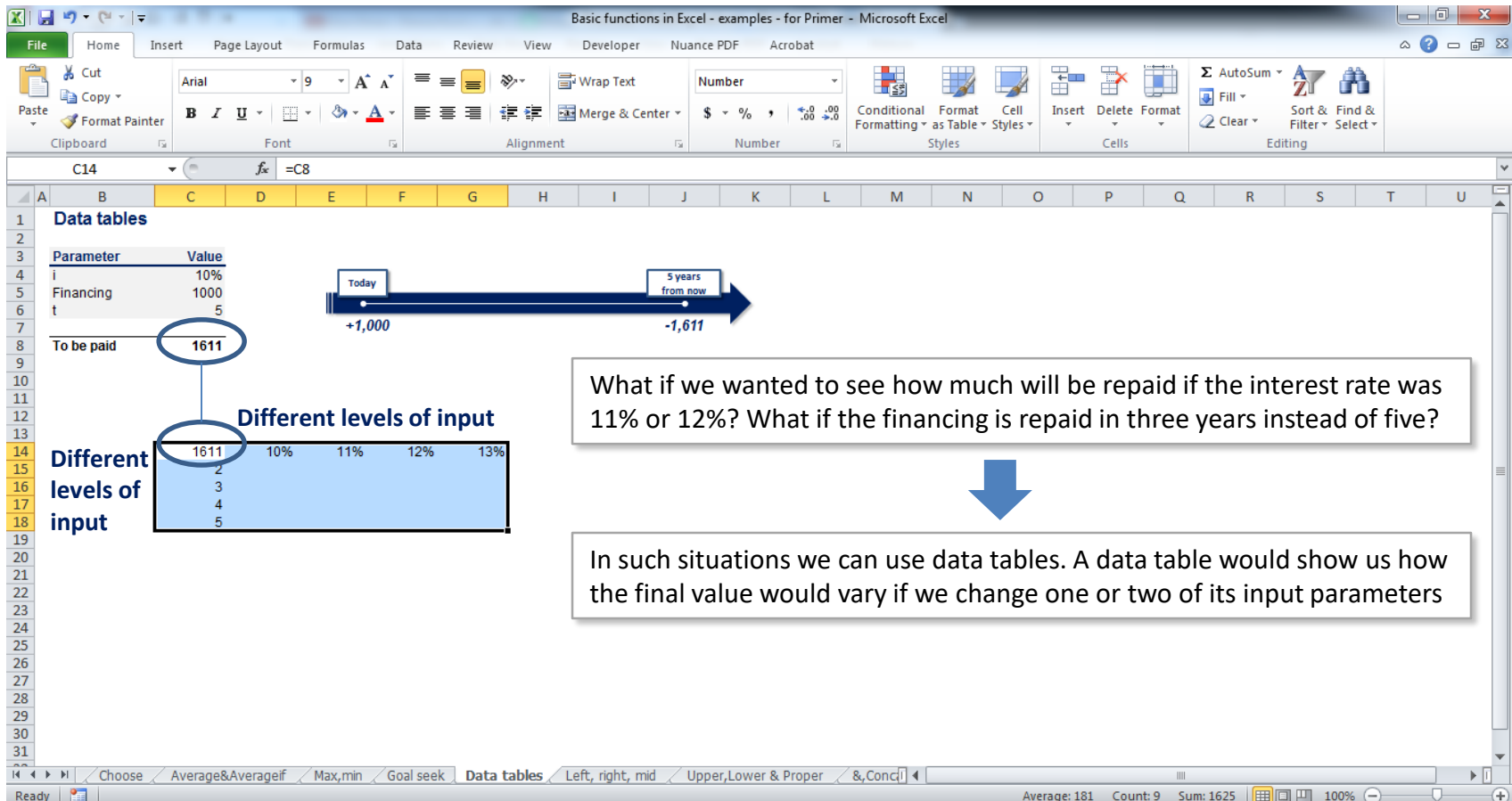
To be paid 1611

Today 5 years from now

+1,000 -1,611

In this sheet is calculated the amount, which will be due in 5 years for a financing of 1,000 that is received today

DATA TABLES



DATA TABLES

Basic functions in Excel - examples - for Primer - Microsoft Excel

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From Access From Web From Text From Other Sources Get External Data Existing Connections Refresh All Properties Edit Links Connections Sort & Filter Filter Clear Reapply Advanced Text to Columns Remove Duplicates Data Validation Consolidate What-If Analysis Group Ungroup Subtotal Show Detail Hide Detail

C14 =C8

Data tables

Parameter	Value
i	10%
Financing	1000
t	5
To be paid	1611

Today 5 years from now

+1,000 -1,611

1611	10%	11%	12%	13%
2				
3				
4				
5				

Go to "What if Analysis" and select Data Table..

Ready Choose Average&Averageif Max,min Goal seek Data tables Left, right, mid Upper,Lower & Proper &,Concl Average: 181 Count: 9 Sum: 1625 100%

DATA TABLES

Basic functions in Excel - examples - for Primer - Microsoft Excel

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From Access From Web From Text From Other Sources Get External Data Existing Connections Refresh All Properties Edit Links Connections Sort & Filter Filter Clear Reapply Advanced Text to Columns Remove Duplicates Data Validation Consolidate What-If Analysis Group Ungroup Subtotal Show Detail Hide Detail Outline

C6 =C8

Data tables

Parameter	Value
i	10%
Financing	1000
t	5
To be paid	1611

Timeline: Today (0) → 5 years from now (-1,611)

Cash flows: +1,000 (Today), -1,611 (5 years from now)

	10%	11%	12%	13%
1611				
2				
3				
4				
5				

Data Table

Row input cell: \$C\$4

Column input cell: \$C\$6

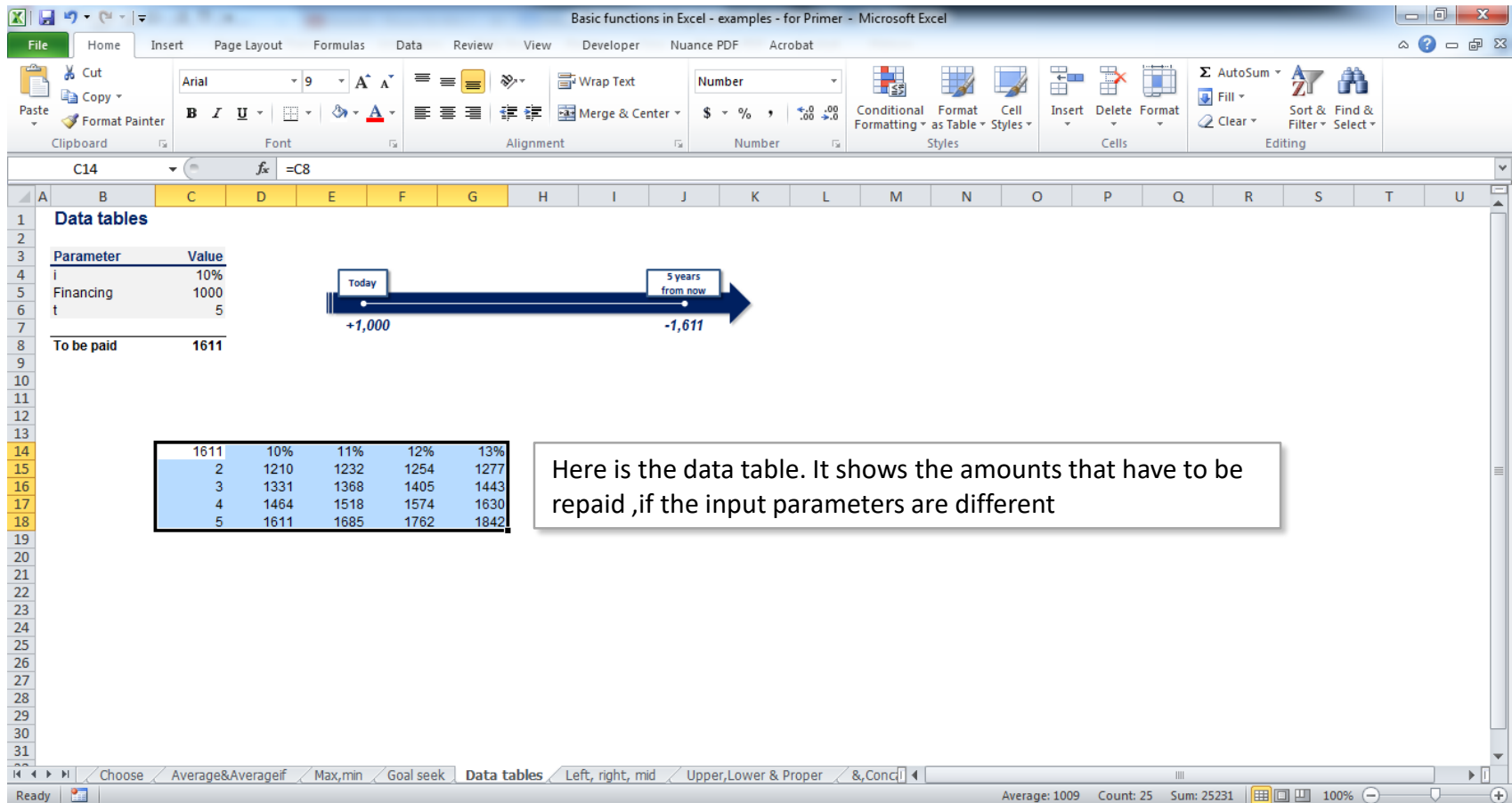
OK Cancel

Select the two input parameters

Choose Average&Averageif Max,min Goal seek **Data tables** Left, right, mid Upper,Lower & Proper &,Concl

Point 100%

DATA TABLES



Pivot tables

PIVOT TABLES

Basic functions in Excel - examples - for Primer - Microsoft Excel

Pivot tables are Excel's dynamic and interactive tables. The data that you see on this sheet includes 15,000 rows and could be hard to elaborate. Pivot tables are a great way to simplify the work with large quantities of data

Year	Type	Product group	Producer					
2011	Convenience stores	Drinks	San Benedetto					
2011	Convenience stores	Drinks	San Benedetto					
2011	Convenience stores	Drinks	San Benedetto	[13/01/02]	5712	0.89	0.97	
2011	Convenience stores	Drinks	San Benedetto	[13/01/03]	4872	0.62	0.9	
2011	Convenience stores	Drinks	San Benedetto	[13/01/04]	6228	0.65	1.07	
2011	Convenience stores	Drinks	San Benedetto	[13/01/05]	9588	0.92	1.01	
2011	Convenience stores	Drinks	San Benedetto	[13/01/06]	7836	1.19	0.96	
2011	Convenience stores	Drinks	San Benedetto	[13/01/07]	7560	1.02	1.09	
2011	Convenience stores	Drinks	San Benedetto	[13/01/30]	8556	0.99	1.1	
2011	Convenience stores	Drinks	San Benedetto	[13/11/01]	9024	0.51	1.15	
2011	Convenience stores	Drinks	San Benedetto	[13/11/01a]	7260	1.04	0.98	
2011	Convenience stores	Drinks	San Benedetto	[13/11/02]	9456	0.85	1.17	
2011	Convenience stores	Drinks	San Benedetto	[13/11/03]	7488	1.19	0.91	
2011	Convenience stores	Drinks	San Benedetto	[13/11/04]	7176	0.56	1.13	
2011	Convenience stores	Drinks	San Benedetto	[13/12/01]	7140	0.72	0.91	
2011	Convenience stores	Drinks	San Benedetto	[13/12/02]	6996	1.2	0.94	
2011	Convenience stores	Drinks	San Benedetto	[13/12/03]	4836	1.18	0.96	
2011	Convenience stores	Drinks	San Benedetto	[13/12/04]	8868	0.5	1.01	
2011	Convenience stores	Drinks	San Benedetto	[13/12/05]	5424	0.82	1.11	
2011	Convenience stores	Drinks	San Benedetto	[13/12/06]	6864	0.86	0.95	
2011	Convenience stores	Drinks	San Benedetto	[13/12/07]	8784	1.05	0.99	
2011	Convenience stores	Drinks	San Benedetto	[13/12/08]	6780	0.55	1.02	
2011	Convenience stores	Drinks	San Benedetto	[13/12/09]	5292	0.51	1.13	
2011	Convenience stores	Drinks	San Benedetto	[13/12/10]	6768	1.12	0.94	
2011	Convenience stores	Drinks	San Benedetto	[13/12/11]	5940	0.84	1.18	
2011	Convenience stores	Drinks	San Benedetto	[13/12/12]	4932	0.48	1.15	
2011	Convenience stores	Drinks	San Benedetto	[13/12/13]	9084	0.44	0.9	

PIVOT TABLES

Basic functions in Excel - examples - for Primer - Microsoft Excel

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PivotTable Table Picture Clip Art Shapes SmartArt Screenshot Column Line Pie Bar Area Scatter Other Charts Line Column Win/Loss Slicer Hyperlink Text Box Header & Footer WordArt Signature Line Object Equation Symbol

PivotTable PivotChart

Year

In order to create a Pivot table, select all of the rows that you would like to include in it (including the titles of the table)

Go to the "Insert" tab and select "Pivot table"

	A	B	C	D	
15091	2013	Convenience stores	Cosmetics	Sephora	
15092	2013	Convenience stores	Cosmetics	Sephora	
15093	2013	Convenience stores	Cosmetics	Sephora	
15094	2013	Convenience stores	Cosmetics	Sephora	
15095	2013	Convenience stores	Cosmetics	Sephora	
15096	2013	Convenience stores	Cosmetics	Sephora	
15097	2013	Convenience stores	Cosmetics	Sephora	
15098	2013	Convenience stores	Cosmetics	Sephora	
15099	2013	Convenience stores	Cosmetics	Sephora	
15100	2013	Convenience stores	Cosmetics	Sephora	
15101	2013	Convenience stores	Cosmetics	Sephora	
15102	2013	Convenience stores	Cosmetics	Sephora	
15103	2013	Convenience stores	Cosmetics	Sephora	
15104	2013	Convenience stores	Cosmetics	Sephora	
15105	2013	Convenience stores	Coffee	Jacobs	
15106	2013	Convenience stores	Coffee	Jacobs	
15107	2013	Convenience stores	Sweets	Sapori di Siena	
15108	2013	Convenience stores	Sweets	Sapori di Siena	
15109	2013	Convenience stores	Sweets	Sapori di Siena	
15110	2013	Convenience stores	Sweets	Sapori di Siena	
15111	2013	Convenience stores	Sweets	Sapori di Siena	
15112	2013	Convenience stores	Sweets	Sapori di Siena	
15113	2013	Convenience stores	Beverages	TIP	
15114	2013	Supermarkets	Vegetables	Monzuro	
15115	2013	Supermarkets	Vegetables	Monzuro	
15116	2013	Supermarkets	Vegetables	Monzuro	
15117	2013	Supermarkets	Vegetables	Monzuro	
15118	2013	Supermarkets	Vegetables	Monzuro	
15119	2013	Supermarkets	Vegetables	Monzuro	
15120	2013	Supermarkets	Vegetables	Monzuro	
15121	2013	Supermarkets	Vegetables	Monzuro	
15122	2013	Supermarkets	Vegetables	Monzuro	

Ready Left, right, mid Upper, Lower & Proper & Concatenate Pivot tables Pivot table example Round

Average: 781.6105949 Count: 120952 Sum: 44113320.37 100%

PIVOT TABLES

The screenshot shows the Microsoft Excel interface with the 'PivotTable Tools' task pane open. The 'Options' tab is selected, showing various actions like 'Expand Entire Field', 'Group Selection', 'Sort', 'Refresh', 'Change Data Source', 'Clear', 'Select', and 'Move PivotTable'. The 'Design' tab is also visible, showing options for 'Summarize Values By', 'Show Values As', 'Fields, Items, & Sets', 'PivotChart', 'OLAP Tools', 'What-If Analysis', 'Field List', 'Buttons', and 'Field Headers'.

In the center of the worksheet, a text box states: "In order to build the Pivot table that serves our needs we have to select these fields and drag them to the boxes below". A blue arrow points from this text box to the 'PivotTable Field List' task pane on the right.

The 'PivotTable Field List' task pane shows a list of fields to add to the report: Year, Type, Product group, Producer, Code, Volume, Unitary cost, and Unitary price. A blue arrow points from this list to the 'Drag fields between areas below' section, which contains four boxes: Report Filter, Column Labels, Row Labels, and Values.

On the left side of the worksheet, a small inset window titled 'PivotTable1' shows a preview of the PivotTable structure, with a checkmark indicating that the fields have been successfully added to the report.

PIVOT TABLES

PivotTable Name: PivotTable1
Active Field: Count of Volume

PivotTable Field List:
 Choose fields to add to report:
☒ Year
☐ Type
☒ Product group
☐ Producer
☐ Code
☒ Volume
☐ Unitary cost
☐ Unitary price

PivotTable Data:

	2011	2012	2013	2014 (6m)	Grand Total
Alcohol	136	168	194	205	703
Beverages	361	370	371	383	1485
Bread products	70	73	83	99	325
Cheese products	108	108	122	123	461
Coffee	264	350	364	375	1353
Corn flakes	70	82	90	91	333
Cosmetics	298	319	343	344	1304
Delicatessen	189	199	199	202	789
Drinks	79				79
Fresh salads	597	673	742	758	2770
Homecare products	111	112	122	127	472
Ice cream	287	290	305	328	1210
Meat	130	134	134	135	533
Sauces	287	301	301	309	1198
Sweets	249	256	259	261	1025
Vegetables	242	263	281	292	1078
Grand Total	3478	3698	3910	4032	15118

Callout 1: We have to select what type of operation needs to be carried out for given fields

Callout 2: In this example Excel counts the "Volume" cells. In each of them we have the actual volume figures and therefore we would like these cells to be summed

PIVOT TABLES

The screenshot shows Microsoft Excel with a PivotTable named 'Count of Volume'. The PivotTable is located in the range A3:G21. The PivotTable Field List task pane is open on the right, showing the following fields:

- ☒ Year
- ☐ Type
- ☒ Product group
- ☐ Producer
- ☐ Code
- ☒ Volume
- ☐ Unitary cost
- ☐ Unitary price

The 'Value Field Settings...' option is highlighted in the task pane. A callout box with the text 'Go to "Value field settings"...' points to this option.

Row Labels	2011	2012	2013	2014 (6m)	Grand Total
Alcohol	136	168	194	205	703
Beverages	361	370	371	383	1485
Bread products	70	73	83	99	325
Cheese products	108	108	122	123	461
Coffee	264	350	364	375	1353
Corn flakes	70	82	90	91	333
Cosmetics	298	319	343	344	1304
Delicatessen	189	199	199	202	789
Drinks	79				79
Fresh salads	597	673	742	758	2770
Homecare products	111	112	122	127	472
Ice cream	287	290	305	328	1210
Meat	130	134	134	135	533
Sauces	287	301	301	309	1198
Sweets	249	256	259	261	1025
Vegetables	242	263	281	292	1078
Grand Total	3478	3698	3910	4032	15118

PIVOT TABLES

The screenshot shows the Microsoft Excel interface with a PivotTable and the Value Field Settings dialog box open. The PivotTable is titled 'Count of Volume' and has 'Column Labels' and 'Row Labels' set to 'Product group'. The 'Value Field Settings' dialog box is open, showing the 'Sum' option selected under 'Summarize value field by'. A callout box points to the 'Sum' option with the text '...and select "Sum"'. The PivotTable Field List on the right shows the 'Volume' field added to the 'Values' area.

Value Field Settings

Source Name: Volume
 Custom Name: Sum of Volume

Summarize Values By: Show Values As

Summarize value field by

Choose the type of calculation that you want to use to summarize data from the selected field.

Sum
 Count
 Average
 Max
 Min
 Product

...and select "Sum"

PivotTable Field List

Choose fields to add to report:

- ☒ Year
- ☐ Type
- ☒ Product group
- ☐ Producer
- ☐ Code
- ☒ Volume
- ☐ Unitary cost
- ☐ Unitary price

Drag fields between areas below:

Report Filter: Year

Column Labels: Year

Row Labels: Product group

Σ Values: Count of Volume

Defer Layout Update: Update

Row Labels	2011	2012	2013	2014 (6m)	Grand Total
Alcohol	136	168	194	205	
Beverages	361	370	371	383	
Bread products	70	73	83	99	
Cheese products	108	108	122	123	
Coffee	264	350	364	375	
Corn flakes	70	82	90	91	
Cosmetics	298	319	343	344	
Delicatessen	189	199	199	202	
Drinks	79				
Fresh salads	597	673	742	758	
Homecare products	111	112	122	127	
Ice cream	287	290	305	328	
Meat	130	134	134	135	
Sauces	287	301	301	309	
Sweets	249	256	259	261	
Vegetables	242	263	281	292	
Grand Total	3478	3698	3910	4032	15118

PIVOT TABLES

Basic functions in Excel - examples - for Primer - Microsoft Excel

PivotTable Name: PivotTable1 Active Field: Sum of Volume

PivotTable Tools: Options Design

PivotTable Field List

Choose fields to add to report:

- ☒ Year
- ☐ Type
- ☒ Product group
- ☐ Producer
- ☐ Code
- ☒ Volume
- ☐ Unitary cost
- ☐ Unitary price

Drag fields between areas below:

Report Filter: Year

Column Labels: Year

Row Labels: Product group

Values: Sum of Volume

The Pivot table displays the Volumes per each product category and for each of the years

	2011	2012	2013	2014 (6m)	Grand Total
Alcohol	222612	315756	384504	294168	1217040
Beverages	39624	49608	52200	22944	164376
Bread products	125700	126996	150924	178296	581916
Cheese products	40656	37776	43692	42888	165012
Coffee	1878156	2513844	2566308	2716272	9674580
Corn flakes	33456	39552	44256	43188	160452
Cosmetics	143052	144972	165888	163884	617796
Delicatessen	85692	88404	90132	91188	355416
Drinks	560892				560892
Fresh salads	541932	603456	671616	682692	2499696
Homecare products	88080	90144	91968	100608	370800
Ice cream	562044	575136	602364	640212	2379756
Meat	67992	69576	70932	72072	280572
Sauces	42756	44700	45036	46044	178536
Sweets	230316	241908	246624	250212	969060
Vegetables	345204	377772	404220	420192	1547388
Grand Total	5008164	5319600	5630664	5764860	21723288